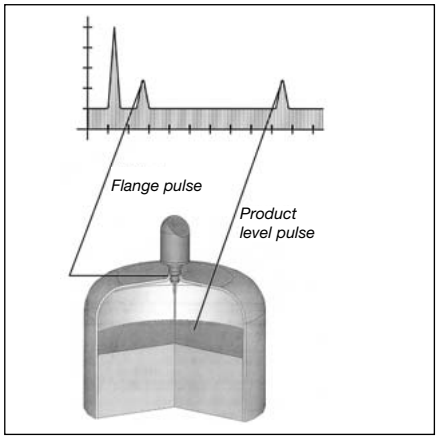
Guided micropulse level measuring systems PulsFox® Technical information/product selection

PMG 01

Probes



Principle of operation

PulsFox® PMG 01 level measuring systems operate on the basis of the TDR principle (time domain reflectometry). This principle uses a probe as a micropulse guide.

Electromagnetic pulses are emitted at the speed of light, reflected by the surface of the medium to be measured and received by the signal converter.

Since the speed of light is constant and independent of the gas composition in the tank, the PMG devices do not require commissioning.

The units do not have any moving parts, thus being almost maintenance-free.

Changes of the medium do not affect the measuring accuracy of the TDR principle.

The pulse´s propagation time is directly proportional to the distance between the probe and the surface of the medium.

Applications

Guided Micropulse devices are used to measure levels and interfaces of liquids, granular materials and powders.

Features

- *The measurement is unaffected by changes in dielectric constant, pressure, temperature or density.*
- *Foam, steam, dust or a turbulent surface of the medium do not affect the accuracy of the measurement.*
- *No recalibration is required when a different medium is used.*
- *A great number of different materials and process connections are available and render the system suitable for use with corrosive media or, for example, in the food industry.*

Probe selection

Rigid/flexible monoprobe type F/E	***Flexible probes type B***	***KOAX probe type C***
	Typical application areas:	
➤ *Cement, limestone, aluminium* ➤ *Highly viscous liquids* ➤ *Plastic powder, e.g. PVC* ➤ *Granular plastic materials*	➤ *Granular plastic materials* ➤ *Light powders with low dielectric constant* ➤ *Alcohols* ➤ *Water supply tanks*	➤ *Tank height ≤ 6 m* ➤ *Solvents, NH_3, foam, alcohol, oil/water, separators*
	Recommended for the following applications:	
➤ *An existing stilling well can be used to create a coax version (calibration required)* ➤ *FEP coating for crystallising products* ➤ *Application with conducting foams*	***For high silos or tanks with liquids, granular materials*** ➤ *Flexible sensors up to 24 m* ➤ *For smaller tanks with little headroom*	***Only for level measurement in clean liquids*** ➤ *In turbulent or flowing liquids the sensor acts like a stilling well* ➤ *Liquid or steam jet in vicinity of probe* ➤ *Can be in contact with metal or tank wall* ➤ *For very low dielectric constants*
	Do not use:	
➤ *For small socket diameters (< DN 100)* ➤ *For high socket*	➤ *Turbulent liquids where probe cannot be anchored* ➤ *Product temperature > 240 °C*	➤ *Crystallising liquids* ➤ *Liquids containing solid matter* ➤ *Products tending to adhere* ➤ *Powders* ➤ *Viscous liquids (e.g. crude oil)*

Guided micropulse level measuring system PulsFox® PMG 01

PMG 01with rigid monoprobe

PMG 01 with flexible monoprobe

Application
For continuous level measurement in containers, tanks or silos. Suitable for electrically conducting or non-conducting liquids and bulk materials. Also suitable for pressurised or vacuum tanks.

Description
PulsFox® level measuring systems operate on the basis of the TDR principle (time domain reflectometry). The measurement is unaffected by changes in dielectric constant, pressure, temperature or density. Foam, steam, dust or a turbulent surface of the medium do not affect the accuracy of the measurement. No recalibration is required when a different medium is used.

Technical specifications

Measuring range
B/E probe ≤ 24 m
C probe ≤ 6 m
F probe ≤ 3 m
Refer to probe type for probe version

Accuracy of measurement
Liquids:
L < 15 m: ±5 mm
L ≥ 15 m: ±0.05 % of measured value
Powders/granular materials:
L < 15 m: ±20 mm
L ≥ 15 m: ±0.05 % of measured value

Dielectric constant (ε_r)

Monoprobe	*≥ 2.3*
Dual probe	*≥ 1.8*
Coax probe	*≥ 1.5*

Operating temperature range

Medium:	*-30 °C/+200 °C*
Flange:	*-30 °C/ +90 °C*
Ambient:	*-30 °C/ +60 °C*
	(Ex version
	-30 °C/ +55 °C)

Process pressure
40 bar

Process connection
G1B
(for PMG 01 DF = G1½B)
Probe type/probe material
F = rigid monoprobe
Stainless steel 1.4571
B / E = 1-2 flexible probe(s):
Stainless steel 1.4401 (Ø 4 mm)
C = coax probe:
Stainless steel 1.4571
Wetted parts:
Stainless steel 1.4571/1.4401, PTFE, FPM

Supply voltage
DC 18-35 V
Ex version ≤ DC 28 V

Output signal
4-20 mA/HART, 2-wire

Housing
Aluminium die cast

Protection
IP 65 (EN 60529)

Electrical connection
Plug DIN 43650-A (IP 65)

CE conformity (EMC)
EN 50082-2, EN 50081-1

Accessories
Operating and configuration software

Options

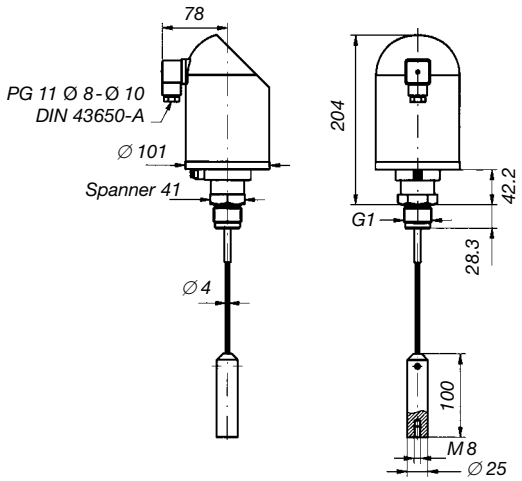
- *Ex versions*
- *Other process connections*
- *Higher pressures*
- *Other probe diameters*
- *Higher flange temperatures*
- *FEP coatings*
- *Other seal materials*
- *Digital plug-in displays*

Refer to page 36 for Part no.

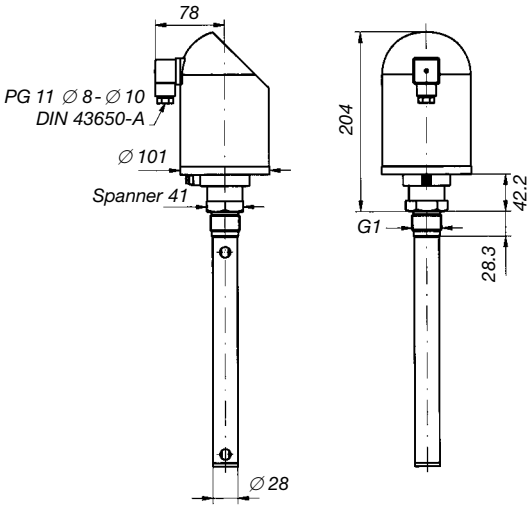
Guided micropulse level measuring system PulsFox® PMG 01 *Types and dimensions (in mm)*

Housing

With flexible monoprobe and DIN plug

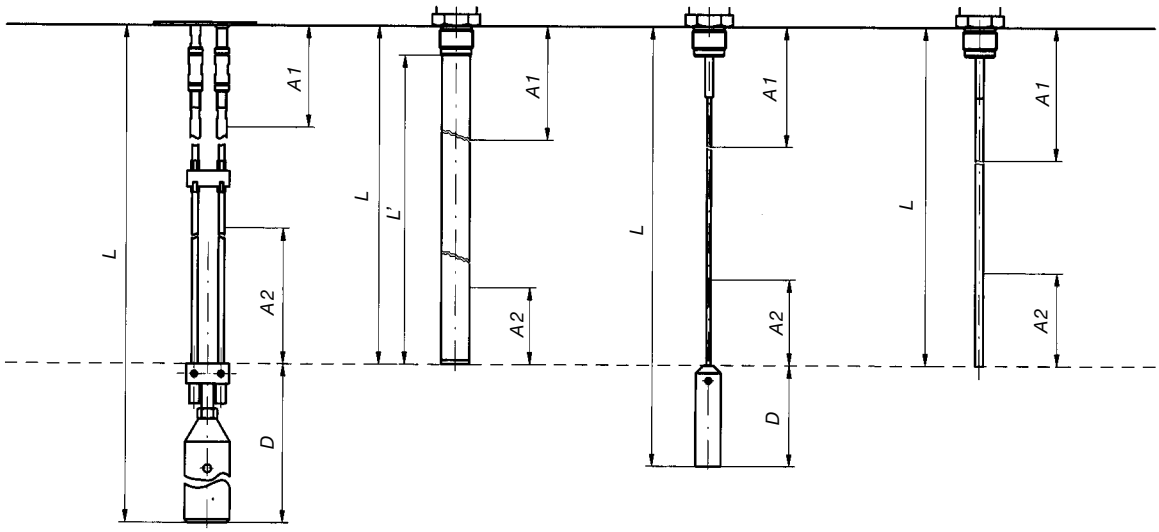


With coax probe and DIN plug



Probes

Type B flexible dual probe | *Type C coax probe* | *Type E flexible monoprobe* | *Type F rigid monoprobe*

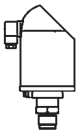
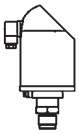
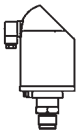
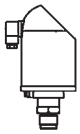


L *= Length (**L'** = Length for coax with flange);* ***A1*** *= Upper blocking distance;*
A2 *= Lower blocking distance;* ***D*** *= range that cannot be measured*

ε_r-value	Zone	Type B	Type C	Type E	Type F
80	A1	300 mm	0 mm	400 mm	400 mm
80	A2	20 mm	10 mm	20 mm	20 mm
2	A1	330 mm	0 mm	500 mm	500 mm
2	A2	100 mm	100 mm	200 mm	200 mm
–	D	80 mm	–	100 mm	–

Guided micropulse level measuring system PulsFox® PMG 01

DG : H

Type	PMG 01 MS	PMG 01 MF	PMG 01 KX	PMG 01 DF
Version				
Probe type	Monoprobe, rigid	Monoprobe, flexible (Ø 4 mm)	Coax probe	Dual probe, flexible
Standard probe length	3 m (max. 3 m)	3 m (max. 24 m)	3 m (max. 6 m)	3 m (max. 24 m)
Accuracy of measurement	refer to data sheet	refer to data sheet	refer to data sheet	refer to data sheet
Max. flange temperature	up to 90 °C	up to 90 °C	up to 90 °C	up to 90 °C
Seal	FPM	FPM	FPM	FPM
Supply voltage	DC 18-35 V	DC 18-35 V	DC 18-35 V	DC 18-35 V
Output signal	4-20 mA/HART	4-20 mA/HART	4-20 mA/HART	4-20 mA/HART
System	2-wire	2-wire	2-wire	2-wire
Electrical connection	Plug DIN 43650	Plug DIN 43650	Plug DIN 43650	Plug DIN 43650
Basic price €				
Part no.	53468	53470	53472	53474
Additional costs €				
ATEX II 1 G IIC or IIB T6...T3				
ATEX II 1/2 D T100 °C (powder)				
Max. Ex flange temperature up to 200 °C				
Process connection				
G1B PN 40	**Standard**	**Standard**	**Standard**	**---**
G1½B PN 40	**---**	**---**	**---**	**Standard**
1" NPT PN 40				**---**
DIN and ANSI flanges	**on request**	**on request**	**on request**	**on request**
Clamp connection	**on request**	**on request**	**on request**	**on request**
Dairy fitting DIN 11851	**on request**	**on request**	**on request**	**on request**
Probe				
Probe extension per m	**---**			
Probe diameter 8 mm	**---**		**---**	**---**
Probe extension Ø 8 mm per m	**---**		**---**	**---**
FEP coating for probe length up to 3 m (only for probe diameter 4 mm)	**---**		**---**	**---**
FEP coating per m	**---**		**---**	**---**
Seal				
FFKM				

Accessories	Part no.	**Price €**
HART USB modem	53485	
Digital plug-in display DA 06	**31278**	
Digital plug-in display DA 06-Ex	31279	

* Process connection = G1½B, weight = Ø 40 x 260 mm